PUBLIC HEALTH REPORTS

VOL. 48 NOVEMBER 17, 1933 No. 46

ACUTE RESPONSE OF GUINEA PIGS TO VAPORS OF SOME NEW COMMERCIAL ORGANIC COMPOUNDS

VII. DICHLOROETHYL ETHER [1]

By H. H. SCHRENK, *Chemist in Charge, Toxicological and Biochemical Laboratory;* F. A. PATTY, *Associate Chemist;* and W. P. YANT, *Supervising Chemist; Health Laboratory Section, Pittsburgh Experiment Station, United States Bureau of Mines*

This report on the acute response of guinea pigs to BB′ dichloroethyl ether vapor is the seventh of a series of similar reports [2] which deal with studies pertinent to establishing a criterion of the toxicity of the vapor of some chemical products which have recently reached, or promise to reach, important domestic or industrial use.

SCOPE OF WORK

The scope of the work included a study of the toxicity and physiological response of guinea pigs exposed to vapors of dichloroethyl ether. Only acute effects as produced by a single exposure were studied. The experiments were planned to cover a range of concentrations which would produce but slight or no response, moderate response, and serious response.

CHEMICAL AND PHYSICAL PROPERTIES

The dichloroethyl ether used in this study is the BB′ dichloroethyl ether. A detailed description of the chemical and physical properties has been given by Fife and Reid.[3] It is a colorless liquid practically

[1] Published by permission of the Director, U.S. Bureau of Mines. Work completed on manuscript April 17, 1933.

[2] Sayers, R. R., Yant, W. P., Waite, C. P., Patty, F. A., and Schrenk, H. H.: Acute Response of Guinea Pigs to Vapors of Some New Commercial Organic Compounds—

I. Ethylene Dichloride. Pub. Health Rep., vol. 45, no. 5, Jan. 31, 1930, pp. 225-239. (Reprint no. 1349.)

II. Ethyl Benzene. Pub. Health Rep., vol. 45, no. 22, May 30, 1930, pp. 1241-1250. (Reprint no. 1379.)

III. Cellosolve. Pub. Health Rep., vol. 45, no. 26, June 27, 1930, pp. 1459-1466. (Reprint no. 1389.)

IV. Ethylene Oxide. Pub. Health Rep., vol. 45, no. 32, August 8, 1930, pp. 1832-1843. (Reprint no. 1401.)

V. Vinyl Chloride. Pub. Health Rep., vol. 45, no. 34, August 22, 1930, pp. 1963-1971. (Reprint no. 1405.)

VI. Dioxan. Pub. Health Rep., vol. 45, no. 35, August 29, 1930, pp. 2023-2032. (Reprint no. 1407.)

[3] Fife, H. R., and Reid, E. W.: New industrial solvents. Ethylene dichloride, dichloroethyl ether, and isopropyl ether. Ind. & Eng. Chem., vol. 22, 1930, pp. 513-515.

insoluble in water but soluble in most organic solvents. It is stable, being quite resistant to alkaline hydrolysis at room temperature. Common physical properties are: Freezing point, −51.7° C.; boiling point, 178.0° C.; specific gravity, 1.22 (20°/20° C.); vapor pressure, approximately 0.73 mm at 20° C.; flash point, 131°F.

It has a pungent odor and is very irritating to the eyes (lacrimosal) and mucous membranes.

SUGGESTED USES OF DICHLOROETHYL ETHER

Dichloroethyl ether is an active solvent for fats, tars, waxes, resins, and similar materials. While not a solvent for the cellulose esters, in combination with alcohol it is an active solvent. It has possibilities of use in the textile industries, either for removing spots or by incorporating in soaps. From a purely chemical standpoint its constitution lends itself to synthesis of other useful compounds.

TEST APPARATUS

The apparatus for preparing the vapor-air mixtures was, in general, the same as that described in a previous report dealing with methanol;[4] however, in certain experiments modifications were introduced. In preparing the highest concentration available (approximately 0.1 percent vapor in air by volume), all the chamber openings were closed and air was blown by means of a fan across a series of wicks suspended in a reservoir of dichloroethyl ether. The fan and saturator were allowed to operate for three hours before the guinea pigs were placed in the chamber, in order to create as near a saturated condition as could be attained in practical use of the chemical at room temperatures.

In all the subsequent concentrations studied (below saturation) the vapor-air mixture was maintained by continuously vaporizing a measured quantity of the liquid in a measured volume of air. To ensure complete vaporization, the liquid was first pumped to an atomizer in the chamber and was atomized into the air, a large gauze cloth being suspended to catch any particle too large to vaporize before reaching the gauze. A large fan continuously blowing air over this gauze vaporized the material and kept the air well stirred.

COMPUTATION AND ANALYSIS OF VAPOR-AIR MIXTURES

No computation of the vapor concentration of saturated air was possible except on the basis of vapor pressure, but in the other cases the concentration was calculated from the quantity of liquid vaporized and the quantity of air flowing through the chambers. The calculated composition was always checked by chemical analysis. The method of analysis consisted of passing a measured volume of the

[4] Yant, W. P., Schrenk, H. H., and Sayers, R. R.: Methanol antifreeze and methanol poisoning. Ind. & Eng. Chem., vol. 23, 1931, pp. 551-555.

atmosphere through two simple, bubble-type absorption tubes containing a saturated solution of alcoholic potassium hydroxide. The solution was then heated to about 100° C. for 1 to 2 hours to aid in the hydrolysis of the dichloroethyl ether. The resulting inorganic chlorides were determined by the Volhard method.

The accuracy of the method was checked by preparing a standard solution of dichloroethyl ether in alcohol and hydrolyzing known volumes of this solution with alcoholic potassium hydroxide at a temperature which just produced simmering. Table 1 gives the results of duplicate analyses.

TABLE 1.—*Results of analysis of samples containing known amounts of dichloroethyl ether*

Dichloroethyl ether taken	Volume of alcoholic KOH used	Length of time heated	Dichloroethyl ether recovered		Percent recovery		Average percent recovery
mg	*cc*	*Hours*	*mg*	*mg*			
12.20	5	1	12.38	12.02	101.5	98.5	100.0
12.20	10	1	12.20	12.02	100.0	98.5	99.3
24.40	10	1	23.72	23.36	97.2	95.7	97.0
24.40	20	1	23.92	24.04	98.0	98.5	98.3
24.40	20	½	22.82	23.43	93.5	96.0	94.8
24.40	20	2	24.28	24.17	99.5	99.0	99.3

Three samples of saturated air were obtained by passing air through two bead towers containing dichloroethyl ether. The first tower was heated to 100° C. and the second to 22° C. The effluent air was passed through two absorption tubes containing a saturated solution of alcoholic potash. The results are given in table 2.

TABLE 2.—*Amount of dichloroethyl ether in saturated air at 22° C. and 745 mm mercury pressure*

Volume of air	Amount of dichloroethyl ether		Total dichloroethyl ether	Percent dichloroethyl ether by volume
	First absorption tube	Second absorption tube		
cc	*mg*	*mg*	*mg*	
2,000	17.2	2.2	19.4	0.16
2,000	15.9	1.2	17.1	.14
2,000	15.9	1.3	17.2	.14

A measured volume of 1 percent dichloroethyl ether in 95 percent alcohol, and also a measured amount of pure dichloroethyl ether were volatilized and the air was passed through alcoholic potash in the absorption tubes. Table 3 gives the results.

TABLE 3.—*Results of recovery of dichloroethyl ether from air after volatilization*

Dichloroethyl ether volatilized	Dichloroethyl ether recovered	Percent recovery
mg	*mg*	
24.4	24.02	98.5
24.4	22.68	93.0

Table 4 gives the results of the computed concentration and the concentration found by chemical analysis for atmospheres used in animal experiments.

TABLE 4.—*Results of analysis of atmospheres used for animal exposures* [a]

Concentration by—		Concentration by—		Concentration by—	
Computation	Analysis	Computation	Analysis	Computation	Analysis
[b] 0.14	0.096	0.060	0.057	0.012	0.0104
[b] .14	.106	.060	.058	.012	.0109
[b] .14	.103	.055	.046	.012	.0104
[b] .14	.095	.055	.049	.004	.0035
.063	.064	.030	.026	----------	----------
.060	.050	.030	.027	----------	----------

[a] Concentration in percent by volume at 25° C. and 760 mm pressure. To convert to milligrams per liter, multiply by 58.5.

[b] Air saturated with dichloroethyl ether at 100° C. and bubbled through dichloroethyl ether at 22° C. contained 0.14 percent vapor. The vapor pressure at 20° C. is approximately 0.73 mm, which would probably be 1.0 to 1.1 mm at 25°, or equivalent to 0.13 or 0.14 percent.

A survey of the results (table 1) shows that when heated from 1 to 2 hours the hydrolysis is complete and that a recovery of 97 to 100 percent can be obtained. When heated for only one half hour the hydrolysis is essentially complete, an average recovery of 94.8 percent being obtained on duplicate samples. Table 2 shows that the vapor may be absorbed in saturated alcoholic potash if two absorption tubes are connected in series, the first retaining 75 to 90 percent of the dichloroethyl ether and the second 10 to 25 percent, a total recovery of more than 95 percent being readily obtainable.

It will also be noted from table 2 that in a laboratory experiment designed to find the concentration in air saturated at room temperature the amount present was 0.14 percent, while in actual experience with the wick device used for animal experiments the highest concentration attainable in the exposure chamber was 0.10 percent (table 4; also see footnote). The reason for this discrepancy is probably due in the main to the fact that the air in the chamber was not completely saturated. However, it is possible that the experimental value (0.14) is somewhat high, owing either to supersaturation, or to the presence of a more volatile halogen constituent or a combination of both. The remainder of the results in table 4 represent atmospheres prepared by volatilizing a measured amount of dichloroethyl ether in a measured volume of air, and the concentra-

tions computed on this basis are in better agreement with the chemical determinations. The latter are rather consistently about 10 to 15 percent lower than the computed results. Part of this discrepancy is attributed to the lack of complete absorption and recovery by the method of analysis (see table 3). The agreement, however, is close enough to establish the conditions of experiment.

TEST PROCEDURE, DESCRIPTION, AND CARE OF ANIMALS

The test procedure, description, and care of animals were the same as those presented in a previous report of experiments with ethylene dichloride,[5] except that it was unnecessary to observe the precautions for dealing with explosive atmospheres.

RESULTS OF TESTS

The detailed test data are too voluminous to be presented in this report, and only summarized results pertinent to objective symptoms, gross pathology, and fatality are given.

OBJECTIVE SYMPTOMS IN ANIMALS

Control animals.—No symptoms were exhibited by the 26 control guinea pigs in these tests, and no deaths occurred.

Exposed animals.—Concentrations of 0.055 to 0.1 percent of dichloroethyl ether vapor by volume in air produced immediate intense irritation of the conjunctiva and nasal mucous membrane, as evidenced by lacrimation and squinting of the eyes and by scratching at the nose with the forepaws. The other symptoms noted were gradual decreasing motility, slight retching and slow laborious respiration gradually becoming shallow and rapid, loss of consciousness, and an occasional deep sighing type of respiration just preceding death. Unsteadiness or what might be interpreted as slight signs of vertigo were observed after removal from exposure, in pigs exposed to 0.1 percent for 90 minutes. Unsteadiness undoubtedly occurred in other pigs exposed for even shorter periods to 0.1 percent, but due to lack of motility it was not definitely observed.

Exposure to 0.026 percent produced a similar symptom picture, but the time required to produce the symptoms was longer, and unconsciousness did not occur until about 450 minutes. The symptom picture for 0.01 percent was similar to that produced by 0.026 percent, except that distinct lacrimation did not occur at any time and again the symptoms were slower in appearing than they were for the higher concentration. Unconsciousness occurred in about 780 minutes. Exposure to 0.0035 percent produced no symptoms during

[5] See footnote 2.

an 810-minute exposure, excepting slight nasal irritation, which occurred after 3 to 10 minutes.

Table 5 gives the average time required to produce the symptoms observed for exposure to 0.1, 0.055, 0.026, 0.0105, and 0.0035 percent by volume dichloroethyl ether vapor in air.

TABLE 5.—*Symptoms produced in guinea pigs during exposure to dichloroethyl ether vapor in air*

Type of symptom	Period of exposure causing symptoms with vapor concentration of—[a]				
	0.1	0.055	0.026	0.0105	0.0035
Nasal irritation:					
Scratching at nose	(b)	(b)	1	2	3-10
Eye irritation:					
Squinting	(b)	(b)	1	20	[c](810)
Lacrimation	1-2	1-2	3	[c](810)	[c](810)
Disturbance in respiration	90	180	310	450	[c](810)
Animals on sides; unable to stand; quiet; dyspnea; gasping respiration	180-300	240-480	445-600	525-810	[c](810)
Death	230-330	360-500	450-740	[d]	[c](810)

[a] Concentration of vapor in percent by volume; time in minutes.
[b] Occurs immediately after start of exposure.
[c] Not observed in the maximum exposure period given in parentheses.
[d] Four died within a period ranging from immediately after to 250 minutes after exposure. Two survived 8 days and were killed for autopsy.

GROSS PATHOLOGY

Control animals.—A total of 26 control guinea pigs were killed for autopsy. These animals were taken from the same stock and were selected in the same manner as were the group of animals used for exposure to dichloroethyl ether vapor-air mixtures. No significant gross pathology was found in the control animals.

Exposed animals.—The gross pathology in animals that died during or after exposure to dichloroethyl ether vapor was moderate to marked congestion of the brain, severe congestion of the lungs and nasal passages, including trachea and bronchi, with emphysema, edema, and hemorrhages of lungs and occasional complete consolidation. These findings were present in animals that died during and after exposure, but tended to be more severe the longer the exposure and in those animals that died after exposure. The liver was markedly congested and the kidneys were slightly congested.

The findings in animals killed immediately after an exposure of 90 minutes to 0.1 percent vapor revealed no gross pathology except slight congestion of the lungs, whereas animals similarly exposed but allowed to live died within 24 hours and autopsy revealed the severe lung pathology described previously, thus showing a delayed response to the vapor. Animals exposed 10 minutes and 30 minutes to 0.1 percent vapor showed slight congestion of the lungs and slight to moderate congestion of kidneys and liver. Those exposed 10 minutes and killed 4 and 8 days after termination of exposure were nega-

tive, while those exposed 30 minutes evidenced congestion of the lungs after 4 days but were negative after 8 days. In general, the majority of the animals exposed to conditions (see fig. 1) causing two or more deaths in a group of six pigs, exhibited more severe congestion, edema, and hemorrhage after 4 days than immediately after exposure, and showed congestion of the lungs in the majority of instances after 8 days. Those animals exposed to conditions causing some damage but no deaths exhibited slight to moderate congestion of the lungs, liver, and kidneys, and in some instances slight congestion of the brain immediately after exposure, and similar or more congestion after 4 days, while after 8 days the condition was either improved or entirely negative.

DISCUSSION OF PATHOLOGY

Dichloroethyl ether is an intense irritant to the respiratory passages and lungs, causing congestion, edema, and hemorrhage of the lung, which progresses with time to, in some instances, complete consolidation, often giving rise to a delayed death 1 to 8 days after exposure. As would be expected under such conditions, the brain shows moderate to marked congestion. Congestion of the liver and kidneys was evident in varying degree. The pathology of dichloroethyl ether is of a nature similar to that produced by other respiratory irritants, such as the acid gases.

FATALITY AND SUMMARY OF PHYSIOLOGICAL RESPONSE

A summary of the fatality and response of guinea pigs exposed to various concentrations of dichloroethyl ether is shown graphically in figure 1. The results of each experiment are designated by a symbol which represents one of six different degrees of severity which occurred in the majority of a group of six pigs.

The six degrees of response are given in the legend on figure 1. In addition to representing the response of each group by symbols, the symbols have been separated into three general zones of probable response.

Conventional degrees of response are given in table 6 for comparison with toxicological data given in the literature for other compounds.[6] [7] [8] [9] [10]

[6] See footnote 2.

[7] Flury, F., and Zernik, F.: Schädliche Gase. Berlin, 1931. Verlag von Julius Springer.

[8] Sayers, R. R., Yant, W. P., Thomas, B. G. H., and Berger, L. B.: Physiological response attending exposures to methyl bromide, methyl chloride, ethyl bromide, and ethyl chloride. Pub. Health Bull. No. 185, United States Public Health Service, 1929, 56 pp.

[9] International critical tables, first ed., 1927, vol. 2, p. 318. Also see errata sheet, vol. 2.

[10] Henderson, Y., and Haggard, H. W.: Noxious gases: American Chemical Society Monograph No. 35, 1927. Chem. Catalog Co., New York.

TABLE 6.—*Acute effects of exposure of guinea pigs to vapor-air mixtures of dichloroethyl ether*

Effects of exposure after various periods of time	Concentration, percent by volume
Kills in a few minutes	(*)
Dangerous to life in 30 to 60 minutes	0.05 to 0.10
Maximum amount for 60 minutes without serious disturbances	0.010 to 0.020
Slight symptoms after several hours or maximum amount without serious disturbances	0.0035

* Not produced by 0.1 percent, the highest concentration attained by evaporation in a closed chamber at 22° C.

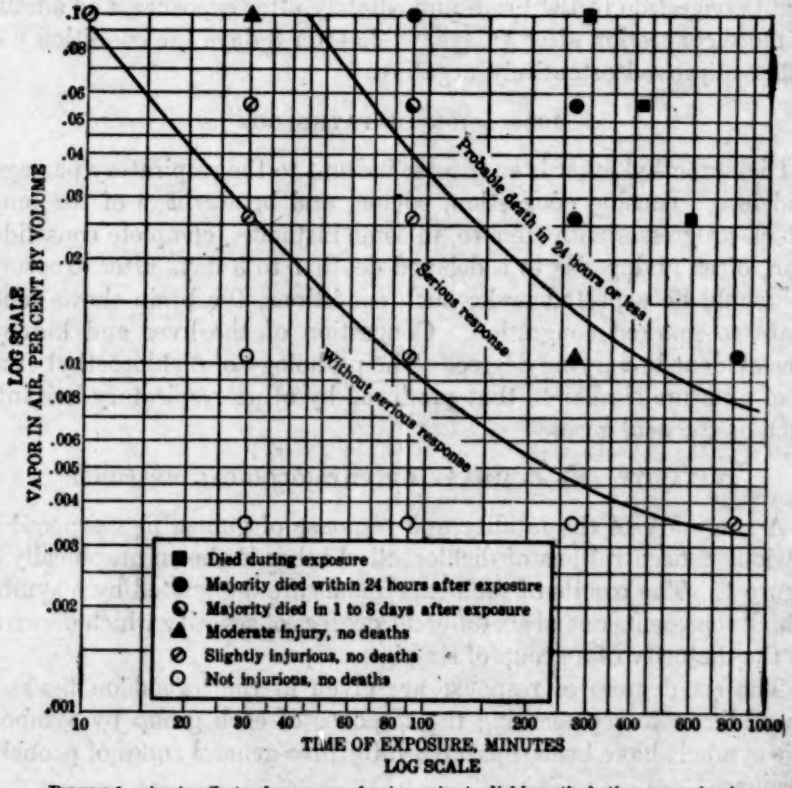

FIGURE 1.—Acute effects of exposure of guinea pigs to dichloroethyl ether vapor in air

CAUSE OF DEATH DURING AND FOLLOWING EXPOSURE

Death was due principally to lung irritation and its sequelae, whether the animal died during or following exposure. The action of this compound may therefore be considered as primarily that of a respiratory irritant.

WARNING PROPERTIES AND HAZARDS OF ACUTE POISONING FROM DICHLOROETHYL ETHER VAPOR

Concentrations of 0.055 and 0.10 percent dichloroethyl ether vapor in air were found, on brief exposure of men, to be very irritating to the eyes and nasal passages. Lacrimation was profuse. Deep inhalations were nauseating in effect. The atmosphere was considered intolerable. A concentration of 0.026 percent vapor was similar in effect but to a lesser degree than in the above-stated concentrations, and, though very objectionable, it was not considered intolerable. The same observers found 0.01 percent vapor objectionable in that it had a slightly nauseating odor and was slightly irritating. A concentration of 0.0035 percent vapor had an easily noticeable odor which was only slightly offensive and practically free from irritation.

Its warning properties are good, especially in concentrations causing harm for short exposures. Its chief danger lies in exposure to low concentrations for a sufficient length of time to cause marked irritation to the respiratory system. It has an easily noticeable but not especially objectionable odor in such concentrations and is only slightly irritating to the nasal passages.

A comparison with toxicological data reported for other compounds [11] shows dichloroethyl ether vapor to be one of the more toxic compounds. Dichloromethyl ether (the methyl derivative corresponding to the ethyl compound studied) is reported [12] to be distinctly irritating in a concentration of 3 p.p.m. (0.0003 percent by volume). A concentration of 100 p.p.m. (0.01 percent) will incapacitate a person for warfare in a few seconds, and an exposure of 1 to 2 minutes may produce a fatal lung injury.

SUMMARY AND CONCLUSIONS

The acute physiological response of guinea pigs to air containing dichloroethyl ether vapor was determined. The concentration of vapor and periods of exposure ranged from those which produced death to those which caused no apparent effect after several hours exposure. The objective symptoms, gross pathology, and fatality are given, with a discussion of the potential health hazards. Also the warning properties as studied by the exposure of persons are described.

1. The physiological action of dichloroethyl ether is primarily irritation of the respiratory passages and the lungs.

2. In the order of their appearance the symptoms produced were nasal irritation, eye irritation, lacrimation, disturbances in respiration, dyspnea, gasping, and death. All of these appeared in concen-

[11] See footnotes 2, 7, 8, 9, and 10.

[12] See footnote 7.

trations of 0.026 to 0.10 percent vapor in air by volume. All except lacrimation were attained with 0.01 percent, while an exposure of 810 minutes to 0.0035 percent caused no symptoms other than signs of slight nasal irritation.

3. The principal gross pathological findings were congestion, emphysema, edema, and hemorrhage of the lungs. These occurred in all animals that died during or after exposure, the severity increasing with length of exposure, and also during 1 to 4 days after exposure.

4. It was not possible at room temperature to attain a concentration that would kill in a short time. Exposure to 0.10 percent for 30 to 60 minutes was dangerous to the life of guinea pigs; 0.01 to 0.02 percent is the maximum amount for 60 minutes without serious disturbance; and 0.0035 is the maximum amount for several hours exposure without serious disturbance.

5. Dichloroethyl ether possesses definite warning properties of odor, as well as eye, nose, and throat irritation in concentrations that are dangerous in an exposure of 1 hour or less. Concentrations below 0.01 percent, dangerous for exposure periods of several hours, possess an easily noticeable though not especially objectionable odor and little or no irritation.

ACKNOWLEDGMENTS

The autopsies and pathological examinations were performed by John Chornyak, Acting Assistant Surgeon, United States Public Health Service, medical officer in charge, pathological laboratory, and S. H. Black, acting assistant surgeon, United States Public Health Service, detailed to the Bureau of Mines.

THE HEALTH OF WORKERS IN DUSTY TRADES

A recent publication [1] completes a series of six studies conducted by the Public Health Service on the health of workers in certain dusty trades, involving specific types of dust. The series included studies of the dusts listed below:

I Cement dust (portland cement plant)
II Siliceous dust (granite-cutting industry)
III Carbon dust (anthracite and bituminous coal industries)
IV Vegetable dust (cotton-cloth manufacturing)

[1] The health of workers in dusty trades. General statement and summary. Lewis R. Thompson, Albert E. Russell, and J. J. Bloomfield. III. Exposure to dust in coal mining. Dean K. Brundage and Elizabeth S. Frasier. (Section on pathology contributed by L. U. Gardner.) IV. Exposure to dust in a textile plant. J. J. Bloomfield and W. C. Dreessen. V. Exposure to the dusts of a silverware manufacturing plant. Jennie C. Goddard. VI. Exposure to municipal dust (street cleaners in New York City). Rollo H. Britten. Public Health Bulletin No. 208. July 1933.

The first 2 studies, I. Cement dust, and II. Siliceous dust, were published as Public Health Bulletins 176 and 178.

V Dusts from silverware manufacturing processes
VI Municipal dust (street sweepers)

In these studies physical examinations and X-rays were supplemented by the observation of groups of workers over a considerable period of time for the purpose of learning something of the character and severity of the sickness they experienced and of correlating such illnesses with occupational environment.

The groups examined were subjected to careful occupational analyses. Dust determinations were made by the same investigator in all the studies, in such a manner as to obtain a fairly accurate estimate of the dustiness of the occupation, the upper and lower limits, and the changes which might take place, especially at different seasons of the year. A general chemical and careful petrographic analysis of the dust was made.

Sanitary surveys, with special reference to the dust hazard, were conducted in each plant.

A sickness record was kept for each person in the group under consideration. Information regarding the nature of the illness and the duration of the case was obtained.

During the period of study a large percentage of the groups under observation were given a general physical examination. Each worker who showed any evidence of lung pathology was placed in a special group for further examination. X-rays were taken of the chests of most of these special cases and sputum examinations made where necessary.

In a few of the studies special analyses were made of mortality data covering a long period of time. Such information was of particular value in the coal and granite-cutting studies.

A few autopsies were performed and the findings are included in the report.

In measuring the effect of dust exposure upon the incidence of disabling sickness in these various industrial groups, it appears that a fairly satisfactory index is the frequency of cases of respiratory disease causing disability for more than one week. In this way attention is placed upon the more serious disabilities, and, furthermore, comparison with other industrial groups is facilitated. The highest rate by far was for granite cutters, especially for pulmonary tuberculosis. Respiratory disease rates were also relatively high for anthracite-coal miners and for employees of the cement plant. For the other dust studies (i.e., soft-coal mining, a textile plant, silverware manufacturing, and street cleaning) the 8-day and longer respiratory-disease rates were not much above the average for male industrial workers generally.

There was a difference in the nature of the respiratory diseases occurring among persons exposed to different kinds of dust. Out-

standing was the very high rate for pulmonary tuberculosis in the granite-cutting plants. The hard-coal group showed high rates for influenza (grippe) and for bronchitis. Influenza occurred at unusual frequency among the employees of the cement plant (in spite of the fact that no epidemic of consequence was noted during the record-keeping period). There was some excess of pleurisy in the granite and hard-coal industries.

The physical examination and X-ray findings in this series of studies clearly indicate an association between the amount and character of dust in the working atmosphere and the effect on the health of the exposed worker. Serious physical impairment was noted only where the workers were exposed for long periods to large amounts of dust containing a high percentage of quartz. Where the dust concentration and quartz percentage were relatively low, there was found only a mild fibrosis which could not in most cases be regarded as due to the particular dust.

The accompanying table gives estimates of the degree of the dust hazard in the different studies.

Summary of degree of dust hazard in the 6 studies

Study	Average dust count in millions of particles per cubic foot of air	Average percentage of free silica (quartz)	Other characteristics of dust	Degree of hazard (under conditons as observed in each study)
Granite cutting:				
a. Hand - pneumatic tool operators.	59	35	Remainder mostly combined silica.	Great excess of pulmonary tuberculosis after 15 years or more exposure; silicosis in from 2 to 10 years.
b. Surface - machine operators, etc.	36			Silicosis after prolonged exposure; no excess of tuberculosis.
c. General air	20			Negative except for occasional nondisabling silicosis.
d. Less than general air.	9			
Anthracite coal:				
Rock drillers	82	31	Siliceous rock	Data insufficient; other studies show severe hazard.
Miners and miners' helpers.	232	1.5	Carbon and inorganic matter.	Dyspnoea and other signs of pneumoconiosis; excess sickness from respiratory conditions; excess mortality from influenza-pneumonia and possibly tuberculosis.
Bituminous coal:				
Rock drillers	78	54	Sandstone	Data insufficient; other studies indicate severe hazard.
Loaders and machine men.	112	1.2	Carbon	Generalized fibrosis chiefly linear in character; excess mortality from influenza and pneumonia.
Cement	26	6-8	Primarily lime	Some early pneumoconiosis; excess of diseases of upper respiratory tract and of influenza.
Cotton-cloth manufacturing.	7	.....	Vegetable and silica	Negative.
Silverware manufacturing	5	1.7	Metal and other	Do.
Municipal	4	.....	Not determined	Do.

PROMPT REPORTS REQUESTED OF CASES OF AMOEBIC DYSENTERY

Because of reports of an unusual number of cases of amoebic dysentery occurring in Chicago and several cases at other localities but having their origin in Chicago, the United States Public Health Service has requested State health authorities to be on the alert for cases and to report them promptly. The following is a copy of a letter recently sent out to the State health officers asking their cooperation:

NOVEMBER 14, 1933.

To All State Health Officers:

Reports to the Public Health Service from the City Health Officer of Chicago, Ill., indicate that amoebic dysentery has appeared in that city, originating from chronic cases and carriers among food handlers. From early in July of this year to November 9, 79 cases with 7 deaths were identified in Chicago, and 34 cases with 8 deaths, having origin in Chicago, have been traced to other places. The diagnoses were confirmed in all cases by laboratory examinations.

In many instances these cases were not generally recognized as amoebic dysentery and some of them have been mistaken for other conditions, such as appendicitis or ulcerative colitis.

It is suggested that physicians and local health officers be advised to be on the alert for cases of this disease, especially those having possible origin in Chicago. In order to get a comprehensive picture of this outbreak it is requested that prompt reports be made to the Public Health Service of all cases of amoebic dysentery occurring in your State, whether they can be traced to the Chicago outbreak or not, but especial interest is centered in those having possible origin in Chicago.

BIOLOGICAL PRODUCTS

ESTABLISHMENTS LICENSED FOR THE PROPAGATION AND SALE OF VIRUSES SERUMS, TOXINS, AND ANALOGOUS PRODUCTS

There is presented herewith a list of the establishments holding licenses issued by the Treasury Department in accordance with the act of Congress approved July 1, 1902, entitled "An act to regulate the sale of viruses, serums, toxins, and analogous products in the District of Columbia, to regulate interstate traffic in said articles, and for other purposes."

The licenses granted to these establishments for the products mentioned do not imply an endorsement of the claims made by the manufacturers for their respective preparations. The granting of a license means that inspection of the establishment concerned and laboratory examinations of samples of its products are made regularly to insure the observance of safe methods of manufacture, to ascertain freedom from contamination, and to determine the potency, or safety, or both, of diphtheria antitoxin, scarlet fever streptococcus antitoxin, tetanus antitoxin, botulinus antitoxin, antidysen-

teric serum, antimeningococcic serum, antipneumococcic serum, bacterial vaccines made from typhoid bacillus, paratyphoid bacillus A, and paratyphoid bacillus B, diphtheria toxin-antitoxin mixture, diphtheria toxoid, diphtheria toxin for Schick test, scarlet fever streptococcus toxin for Dick test, scarlet fever streptococcus toxin for immunization, and the arsphenamines, the only products for which potency standards or tests have been established.

The enumeration of the products is as follows: Serums are placed first, the antitoxins, being more important, heading the list. The other products are arranged generally in the order of their origin. The items in each class are arranged alphabetically.

Establishments Licensed and Products for Which Licenses Have Been Issued

AMERICAN ESTABLISHMENTS

Parke, Davis & Co., Detroit, Mich.—License no. 1:

Diphtheria antitoxin; meningococcus antitoxin; perfringens antitoxin; scarlet fever streptococcus antitoxin; tetanus antitoxin; vibrion septique antitoxin; antianthrax serum; antidysenteric serum; antigonococcic serum; antimeningococcic serum; antipneumococcic serum; antistreptococcic serum; hemostatic serum (Lapenta); normal horse serum; thyroidectomized horse serum; vaccine virus; rabies vaccine (Cumming); tuberculin old; tuberculin T.R.; tuberculin B.E.; tuberculin B.F.; bacterial vaccines made from acne bacillus, acne diplococcus, Brucella melitensis, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, meningococcus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, prodigiosus bacillus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus and typhoid bacillus; diphtheria toxinantitoxin mixture; diphtheria toxoid-antitoxin mixture; diphtheria toxoid, diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization; animal epidermal extracts; animal food extracts; vegetable food extracts; pollen extracts; modified bacterial derivatives made from colon bacillus, gonococcus, paratyphoid bacillus A, paratyphoid bacillus B, pneumococcus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; bacterial antigens made from colon bacillus, gonococcus, pertussis bacillus, pneumococcus, staphylococcus albus, staphylococcus aureus, and streptococcus.

Mulford Biological Laboratories, Sharp & Dohme, Broad and Wallace Streets, Philadelphia, Pa.—License no. 2:

Botulinus antitoxin; diphtheria antitoxin; erysipelas streptococcus antitoxin; B. histolyticus antitoxin; B. odematiens antitoxin; perfringens antitoxin; scarlet fever streptococcus antitoxin; B. sordelli antitoxin; tetanus antitoxin; vibrion septique antitoxin; antianthrax serum; antidysenteric serum; antigonococcic serum; antimelitensis serum; antimeningococcic serum; antipneumococcic serum; antistreptococcic serum, antivenin (Nearctic crotalidae); antivenin Bothropic; antivenin (crotalus terrificus); normal horse serum; vaccine virus; rabies vaccine (Pasteur); rabies vaccine (killed virus); tuberculin old; tuberculin T.R.; tuberculin B.E.; tuberculin B.F.; bacterial vaccines made from acne bacillus, cholera vibrio, colon bacillus, dysentery bacillus, Friedländer bacillus, gonococcus, influenza bacillus, meningococcus, micrococcus catarrhalis, micrococcus melitensis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, plague bacillus, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; sensitized bacterial vaccines made from acne bacillus, cholera vibrio, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, meningococcus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; diphtheria toxin-antitoxin mixture; diphtheria toxoid; staphylococcus toxoid; diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization; pollen extracts; animal epidermal extracts; animal food extracts; vegetable food extracts; poison ivy extract; poison oak extract; pneumococcus antibody solution; bacterial antigen made from streptococci; snake venom solution.

The Cutter Laboratory, Berkeley, Calif.—License no. 8:

Diphtheria antitoxin; B. odematiens antitoxin; perfringens antitoxin; scarlet fever streptococcus antitoxin; B. sordelli antitoxin; tetanus antitoxin; vibrion septique antitoxin; antianthrax serum; antistreptococcic serum; normal horse serum; vaccine virus; rabies vaccine (Pasteur); rabies vaccine (killed virus); tuberculin old; tuberculin B.F.; bacterial vaccines made from acne bacillus, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, pseudodiphtheria bacillus,

staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; bacterial antigens made from colon bacillus, staphylococcus aureus; diphtheria toxin-antitoxin mixture; diphtheria toxoid; diphtheria toxin for Schick test; pollen extracts; poison ivy extract; poison oak extract.

Bureau of Laboratories, Department of Health, Foot East Sixteenth Street, New York City.—License no. 14:

Vaccine virus.

Lederle Laboratories (Inc.), Pearl River, N.Y.—License no. 17:

Diphtheria antitoxin; erysipelas streptococcus antitoxin; B. histolyticus antitoxin; B. odematiens antitoxin; perfringens antitoxin; B. sordelli antitoxin; tetanus antitoxin; vibrion septique antitoxin; antianthrax serum; antidysenteric serum; antigonococcic serum; antimeningococcic serum; antipneumococcic serum; antistreptococcic serum; measles immune serum; normal horse serum; vaccine virus; rabies vaccine (killed virus); tuberculin old; tuberculin B.E.; tuberculin B.F.; bacterial vaccines made from acne bacillus, Brucella melitensis, cholera vibrio, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, meningococcus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, plague bacillus, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, staphylococcus citreus, streptococcus, and typhoid bacillus; diphtheria toxin-antitoxin mixture; diphtheria toxoid; staphylococcus toxoid; diphtheria toxin for Schick test; pollen extracts; poison ivy extract; poison oak extract; animal epidermal extracts; animal food extracts; vegetable food extracts; animal oil extracts; vegetable oil extracts; oidiomycon extract; trichophyton extract.

Bacterio-Therapeutic Laboratory, Asheville, N.C.—License no. 23:

Watery extract of tubercle bacilli (von Ruck); modified tubercle bacillus derivative (von Ruck).

G. H. Sherman, M.D., Inc., 14600 East Jefferson Avenue, Detroit, Mich.—License no. 30:

Bacterial vaccines made from acne bacillus, Brucella melitensis, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, meningococcus, micrococcus catarrhalis, nonvirulent tubercle bacillus, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; diphtheria toxoid; pollen extracts; bacterial antigens made from colon bacillus, gonococcus, micrococcus catarrhalis, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, and streptococcus.

The Abbott Laboratories, Fourteenth Street and C.-W. Interurban Railroad Tracks, North Chicago, Ill.—License no. 43:

Bacterial vaccines made from acne bacillus, Brucella melitensis, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, micrococcus catarrhalis, micrococcus tetragenus, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; bacterial antigens made from acne bacillus, B. coli, Friedländer bacillus, gonococcus, micrococcus catarrhalis, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus; pollen extracts; animal epidermal extracts; animal food extracts; vegetable food extracts.

The Upjohn Co., Kalamazoo, Mich.—License no. 51:

Bacterial vaccines made from colon bacillus, gonococcus, influenza bacillus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; pollen extracts.

E. R. Squibb & Sons' Research and Biological Laboratories, New Brunswick, N.J.—License no. 52:

Diphtheria antitoxin, erysipelas streptococcus antitoxin, scarlet fever streptococcus antitoxin, tetanus antitoxin; antimeningococcic serum; antipneumococcic serum; antistreptococcic serum; normal horse serum; vaccine virus; rabies vaccine (Pasteur); rabies vaccine (killed virus); bacterial vaccines made from acne bacillus, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, meningococcus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, staphylococcus citreus, streptococcus, and typhoid bacillus; bacterial antigen made from staphylococcus aureus; leucocytic extract from the horse; diphtheria toxin-antitoxin mixture; diphtheria toxoid; diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization; pollen extracts; poison-ivy extract; poison-oak extract; arrphenamine, neoarsphenamine, sulpharsphenamine.

Eli Lilly & Co., Indianapolis, Ind.—License no. 56:

Diphtheria antitoxin; erysipelas streptococcus antitoxin; perfringens antitoxin; tetanus antitoxin; vibrion septique antitoxin; antimeningococcic serum; antipneumococcic serum; antistreptococcic serum; normal horse serum; hemostatic serum (Lilly), vaccine virus; rabies vaccine (Harris); tuberculin old; bacterial vaccines made from acne bacillus, cholera vibrio, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, plague bacillus, pneumococcus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; bacterial vaccine made from partially autolized pneumococci; diphtheria toxin-antitoxin mixture; diphtheria toxoid; diphtheria toxin for Schick test; bacterial antigens made from acne bacillus, colon bacillus, gonococcus, pneumococcus, staphylococcus albus, staphylococcus aureus, and streptococcus.

Gilliland Laboratories, Marietta, Pa.—License no. 63:
Diphtheria antitoxin; scarlet fever streptococcus antitoxin; tetanus antitoxin; antimeningococcic serum; antipneumococcic serum; antistreptococcic serum; normal horse serum; vaccine virus; rabies vaccine (Pasteur); rabies vaccine (killed virus); tuberculin old; tuberculin B.E.; tuberculin B.F.; bacterial vaccines made from acne bacillus, gonococcus, influenza bacillus, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; diphtheria toxin-antitoxin mixture; diphtheria toxoid; diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization.

Antitoxin and Vaccine Laboratory, Department of Public Health, Commonwealth of Massachusetts, 375 South Street, Jamaica Plain, Boston 30, Mass.—License no. 64:
Diphtheria antitoxin; scarlet fever streptococcus antitoxin; antimeningococcic serum; antipneumococcic serum; vaccine virus; tuberculin old; bacterial vaccines made from paratyphoid bacillus A, paratyphoid bacillus B, and typhoid bacillus; diphtheria toxin-antitoxin mixture; diphtheria toxoid, diphtheria toxin for Schick test.

United States Standard Products Co., Woodworth, Wis.—License no. 65:
Diphtheria antitoxin; tetanus antitoxin; antimeningococcic serum; normal horse serum; vaccine virus; rabies vaccine (killed virus); bacterial vaccines made from acne bacillus, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; bacterial antigens made from staphylococcus albus, staphylococcus aureus; diphtheria toxin-antitoxin mixture; diphtheria toxoid; diphtheria toxin for Schick test.

D. L. Harris Laboratories, Metropolitan Building, St. Louis, Mo.—License no. 66:
Rabies vaccine (Harris).

The Arlington Chemical Co., Yonkers, N.Y.—License no. 67:
Bacterial vaccines made from colon bacillus, micrococcus catarrhalis, micrococcus tetragenus, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, staphylococcus citreus, streptococcus; pollen extracts; animal epidermal extracts; animal food extracts; vegetable food extracts.

Dermatological Research Laboratories, 1720 Lombard Street, Philadelphia, Pa. (branch of Abbott Laboratories, Chicago, Ill).—License no. 68:
Arsphenamine; silver arsphenamine; neoarsphenamine; sulpharsphenamine; bismuth arsphenamine sulphonate; neosilver arsphenamine.

H. A. Metz Laboratories, 33 Riverside Avenue, Rensselaer, N.Y.—License no. 69:
Arsphenamine; arsphenamine diglucoside; neoarsphenamine; sodium arsphenamine; silver arsphenamine; neosilver arsphenamine; sulpharsphenamine.

Diarsenol Co. (Inc.), 771 Ellicott Square, Buffalo, N.Y.—License no. 70:
Arsphenamine; neoarsphenamine; sodium arsphenamine; sulpharsphenamine.

Mallinckrodt Chemical Works, St. Louis, Mo.—License no. 77:
Arsphenamine; neoarsphenamine; sulpharsphenamine.

Merck & Co. (Inc.), 916 Parrish Street, Philadelphia, Pa.—License no. 82:
Arsphenamine; neoarsphenamine; sulpharsphenamine; a compound of glucose with arsphenamine base.

Terrell Laboratories, Texas National Bank Building, Fort Worth, Tex.—License no. 84:
Rabies vaccine (killed virus).

Jensen-Salsbery Laboratories, Twenty-first and Penn Street, Kansas City, Mo.—License no. 85:
Botulinus antitoxin; antianthrax serum; rabies vaccine (killed virus); bacterial vaccine made from Brucella melitensis.

The Neosol Co., 72 Kingsley Street, Buffalo, N.Y.—License no. 90:
Solution of neoarsphenamine; solution of sulpharsphenamine.

Hollister Stier Laboratories, Paulson Medical and Dental Building, Spokane, Wash.—License no. 91:
Bacterial vaccines made from acne bacillus, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, micrococcus catarrhalis, pertussis bacillus, pneumococcus, staphylococcus albus, staphylococcus aureus, streptococcus, and xerosis bacillus; pollen extracts.

Medical Arts Laboratory, Medical Arts Building, Oklahoma City, Okla.—License no. 98:
Rabies vaccine (killed virus).

Bureau of Laboratories, Michigan State Department of Health, Lansing, Mich.—License no. 99.
Diphtheria antitoxin; scarlet fever streptococcus antitoxin; tetanus antitoxin; antimeningococcic serum; vaccine virus; rabies vaccine (Cumming); tuberculin old; bacterial vaccines made from paratyphoid bacillus A, paratyphoid bacillus B, and typhoid bacillus; bacterial antigens made from colon bacillus, staphylococcus aureus, streptococcus; diphtheria toxin-antitoxin mixture; diphtheria toxoid; diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization.

G. D. Searle & Co., 4735 Ravenswood Avenue, Chicago, Ill.—License no. 100:
Arsphenamine; neoarsphenamine; sulpharsphenamine.

National Drug Co., 5109 Germantown Avenue, Philadelphia, Pa.—License no. 101:
Diphtheria antitoxin, perfringens antitoxin; tetanus antitoxin; vibrion septique antitoxin; antimeningococcic serum; antipneumococcic serum; antistreptococcic serum; normal horse serum; tuberculin old; vaccine virus; rabies vaccine (killed virus); bacterial vaccines made from acne bacillus, Brucella melitensis, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, meningococcus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; diphtheria toxin-antitoxin mixture; diphtheria toxoid; diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization; pollen extracts.

American Chemical Laboratories, 5109 Germantown Avenue, Philadelphia, Pa.—License no. 102:
Poison ivy extract; poison oak extract.

Allergy Laboratories, 1200 North Walker Street, Oklahoma City, Okla.—License no. 103:
Pollen extracts; vegetable food extracts; animal epidermal extracts.

Hixson Laboratories (Inc.), Johnstown, Ohio.—License no. 104:
Diphtheria antitoxin; tetanus antitoxin; rabies vaccine (killed virus); diphtheria toxin-antitoxin mixture; diphtheria toxoid; diphtheria toxin for Schick test.

C. F. Kirk Co., Bloomfield, N.J.—License no. 105:
Bacterial vaccines made from acne bacillus, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, staphylococcus albus, staphylococcus aureus, streptococcus and typhoid bacillus.

The Porro Biological Laboratories, Rhodes Medical Arts Building, Tacoma, Wash.—License no. 107:
Pollen extracts.

Knapp & Knapp, North Hollywood, Calif.—License no. 106:
Pollen extracts.

Allen-Sandlin Laboratories, 225 Breslin Building, Louisville, Ky.—License no. 109:
Bacterial antigens made from colon bacillus, pneumococcus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus.

Pitman-Moore Co., Zionsville, Ind.—License no. 110:
Bacterial vaccines made from acne bacillus, colon bacillus, Brucella melitensis, Friedländer bacillus, gonococcus, influenza bacillus, micrococcus catarrhalis, micrococcus tetragenus, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; pollen extracts.

The Wm. S. Merrell Co., Cincinnati, Ohio.—License No. 111:
Bacterial vaccines made from paratyphoid bacillus A, paratyphoid bacillus B, typhoid bacillus; bacterial antigens made from colon bacillus, staphylococcus aureus; diphtheria toxin for Schick test.

FOREIGN ESTABLISHMENTS

Institut Pasteur de Paris, Paris, France.—License No. 11. Selling agents for the United States, Mr. A. Charklian, Pasteur Vaccine Laboratories of France, 516 Fifth Avenue, New York, N.Y.:
Diphtheria antitoxin; tetanus antitoxin; antianthrax serum; antidysenteric serum; antiplague serum; antistreptococcic serum; bacterial vaccines made from cholera vibrio, plague bacillus, staphylococcus albus, and staphylococcus aureus.

Interessen Gesellschaft Farbenindustrie Aktiengesellschaft, Hoechst am Main, Germany.—License No. 24. Selling agents for the United States, The Winthrop Chemical Co., 170 Varick Street, New York City:
Diphtheria antitoxin; tetanus antitoxin; antistreptococcic serum; normal horse serum; tuberculin old; tuberculin T. R.; tuberculin B. E.; tuberculin B. F.; bacterial vaccines made from cholera vibrio, gonococcus, staphylococcus albus, staphylococcus aureus, and staphylococcus citreus; typhoid bacillus; sensitized bacterial vaccine made from typhoid bacillus; trichophyton extract; arsphenamine; neoarsphenamine; sodium arsphenamine; silver arsphenamine; neosilver arsphenamine; sulpharsphenamine; sulphoxylarsphenamine.

E. Merck, Darmstadt, Germany.—License No. 31. Selling agents for the United States, Merck & Co., 45-47 Park Place, New York City:
Tuberculin Ointment (Moro).

Connaught Antitoxin Laboratory, University of Toronto, Toronto, Canada.—License No. 73:
Diphtheria antitoxin; staphylococcus antitoxin; tetanus antitoxin; diphtheria toxoid; staphylococcus toxoid.

Laboratoire de Biochimie Médicale, 19-21 rue Van-Loo, Paris, France.—License No. 83. Selling agents for the United States, Anglo-French Drug Co., 1270 Broadway, New York City. Selling agents for Puerto Rico, Chas. Vere, Box 216, San Juan, P.R.:
Sulpharsphenamine.

Instituto Sieroterapico Milanese, via Darwin 20, Milan, Italy.—License No. 87. Selling agents for the United States, Opo-Pharmacal Co., 27 Cleveland Place, New York City:
Antianthrax serum; bacterial vaccines made from gonococcus, pneumococcus, staphylococcus albus, staphylococcus aureus, staphylococcus citreus and streptococcus; neoarsphenamine.

Boots Pure Drug Co., Ltd., Nottingham, England.—License No. 92. Selling agents for the United States, The United Drug Co., 43 Leon Street, Boston, Mass.:
Arsphenamine diglucoside.

Etablissements Mouneyrat, Villeneuve-la-Garenne, Seine, France.—License No. 94. Selling agents for the United States, G. J. Wallau, 153 Waverly Place, New York City:
Phospharsphenamine.

Sero-Bacteriological Department, Bayer-Meister-Lucius, Behringswerke, I. G. Farbenindustrie, A. G. Section, Marburg-Lahn, Germany.—License No. 97. Selling agents for the United States, The Winthrop Chemical Co., 170 Varick Street, New York City:
Bacterial vaccines made from colon bacillus, gonococcus, pneumococcus, pyocyaneus bacillus, staphylococcus albus, staphylococcus aureus, streptococcus.

Laboratoire de Bacteriophage, 75 rue Olivier de Serres, Paris, France.—License No. 108. Selling agents for the United States, Anglo-French Drug Co., 1270 Broadway, New York City:
Bacterial antigens made from colon bacillus, dysentery bacillus, enterococcus, Friedländer bacillus, paratyphoid bacillus A, paratyphoid bacillus B, pneumococcus, proteus bacillus, pyocyaneous bacillus, staphylococcus, streptococcus, and typhoid bacillus.

COURT DECISION RELATING TO PUBLIC HEALTH

Sewerage company held not liable for damages to land resulting from permanent nuisance where nuisance had existed before purchase of land by plaintiffs.—(Texas Court of Civil Appeals; *Bowie Sewerage Co.* v. *Vann et al.*, 59 S.W. (2d) 180; decided Oct. 22, 1932.) An action was brought by a husband and wife to recover damages for the depreciation in the market value of their land and also for injury to their health, alleged to have resulted by reason of the pollution by the defendant sewerage company of a creek which ran through their land. The land was purchased by the plaintiffs in 1925 and the creek was first polluted in 1916. Damages were awarded to the plaintiffs in the trial court and the sewerage company appealed.

The jury had found that the nuisance complained of was a permanent nuisance, and the court of civil appeals stated that it believed that the facts were sufficient to sustain such finding. "The question then arises", said the court, "as to whether or not plaintiffs can recover for the depreciation in the market value of their land caused by the permanent nuisance which had existed 9 years before their purchase". In holding that the plaintiffs could not recover and in rendering judgment for the company, the court said:

> If the nuisance was permanent, then a cause of action accrued to plaintiffs' predecessor in title who owned the land when the pollution of the stream by reason of the flow of sewage from the septic pool across the land was first apparent. 17 C.J. 716, and authorities cited above. Whether or not he was ever compensated for that right of action does not appear from the record before us. But even if he was not, that right of action was never acquired by plaintiffs by subsequent conveyances of the land to them, since it was a personal right in him. 46 C.J. 737. It follows, then, that plaintiffs acquired the property with its market value already depreciated by reason of the permanent nuisance and, therefore, they are in no position to claim damages to which such former owner alone was entitled, if any, the measure of which was the depreciation in the market value of the property, in the determination of which personal discomforts resulting from noxious odors and germs of disease emanating from the sewage could be taken into consideration. * * *

From the foregoing conclusions it follows that the judgment of the trial court must be reversed and judgment be here rendered for appellant * * *.

DEATHS DURING WEEK ENDED OCTOBER 28, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Oct. 28, 1933	Corresponding week 1932
Data from 85 large cities of the United States:		
Total deaths	7,470	7,246
Deaths per 1,000 population, annual basis	10.5	10.3
Deaths under 1 year of age	531	487
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	45	40
Deaths per 1,000 population, annual basis, first 43 weeks of year	10.8	11.1
Data from industrial insurance companies:		
Policies in force	67,525,404	70,081,265
Number of death claims	12,187	12,742
Death claims per 1,000 policies in force, annual rate	9.4	9.5
Death claims per 1,000 policies, first 43 weeks of year, annual rate	9.8	9.6

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended November 4, 1933, and November 5, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Nov. 4, 1933, and Nov. 5, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932
New England States:								
Maine	2	2	----	4	----	2	0	0
New Hampshire	----	----	----	----	3	----	0	0
Vermont	----	----	----	----	2	1	0	0
Massachusetts	25	29	----	4	119	56	2	1
Rhode Island	1	4	----	----	----	----	0	1
Connecticut	9	6	2	----	15	2	1	0
Middle Atlantic States:								
New York	37	56	[1] 29	[1] 6	239	241	1	7
New Jersey	26	34	18	9	12	74	0	3
Pennsylvania	83	93	----	----	96	124	3	2
East North Central States:								
Ohio	140	95	4	18	28	88	1	0
Indiana	104	64	51	36	10	9	0	3
Illinois	49	114	16	10	17	54	7	4
Michigan	39	25	4	10	6	158	2	0
Wisconsin	14	11	33	18	17	87	0	0
West North Central States:								
Minnesota	14	12	1	2	1	48	0	0
Iowa [1]	13	25	----	5	1	4	0	0
Missouri	112	105	2	----	5	3	0	0
North Dakota	9	2	4	----	2	31	0	0
South Dakota	4	2	1	1	54	3	0	1
Nebraska	9	37	10	----	1	1	0	0
Kansas	38	35	----	1	4	10	0	1
South Atlantic States:								
Delaware	----	8	----	----	----	----	1	0
Maryland [1] [2]	23	26	11	8	9	1	0	2
District of Columbia	10	8	----	----	5	1	3	0
Virginia	116	62	----	----	38	34	0	0
West Virginia	124	40	10	----	2	29	0	1
North Carolina [4]	163	96	15	8	222	96	2	1
South Carolina [4]	32	25	327	401	28	4	0	0
Georgia [3]	52	88	----	----	32	2	0	0
Florida [3]	13	25	1	1	3	1	0	0
East South Central States:								
Kentucky	180	86	10	85	3	37	2	3
Tennessee	98	101	36	41	109	5	0	0
Alabama [4]	59	70	36	34	3	1	0	0
Mississippi	37	41	----	----	----	----	0	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Nov. 4, 1933, and Nov. 5, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932
West South Central States:								
Arkansas	33	40	6	21	15	2	1	0
Louisiana	50	38	9	9	4	2	0	0
Oklahoma [1]	118	105	19		7	1	1	3
Texas [1]	298	175	131	59	12	4	0	0
Mountain States:								
Montana	3		13		3	79	0	0
Idaho		3					0	0
Wyoming	1				1	2	0	0
Colorado	7	14			4	9	0	1
New Mexico	11	26	2	275	25		0	1
Arizona		4	9	21	32	4	0	0
Utah [1]	1	1	4	4	43		0	0
Pacific States:								
Washington	2	4	1		44		2	0
Oregon	2	3	15	32	44	25	1	1
California	50	66	70	358	169	27	3	2
Total	2,211	1,906	900	1,481	1,489	1,362	35	39

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932
New England States:								
Maine	2	7	18	15	0	0	7	6
New Hampshire	0	0	19	20	0	0	0	0
Vermont	4	0	3	3	0	0	0	0
Massachusetts	3	0	133	206	0	0	2	4
Rhode Island	0	0	10	29	0	0	0	0
Connecticut	3	0	53	54	0	0	0	4
Middle Atlantic States:								
New York	18	5	270	294	0	3	23	17
New Jersey	3	6	100	121	0	0	6	5
Pennsylvania	7	20	345	356	0	0	39	36
East North Central States:								
Ohio	13	4	656	419	0	22	39	19
Indiana	0	0	228	103	0	1	11	4
Illinois	5	4	336	315	0	1	28	19
Michigan	2	1	222	201	0	0	15	12
Wisconsin	7	1	80	78	18	3	3	4
West North Central States:								
Minnesota	12	3	60	44	4	2	2	1
Iowa [1]	1	0	97	27	1	7	1	1
Missouri	0	0	136	153	2	0	5	7
North Dakota	1	1	5	4	0	2	1	1
South Dakota	1	1	26	6	1	0	5	0
Nebraska	0	0	44	45	7	0	0	5
Kansas	2	1	139	84	5	0	9	5
South Atlantic States:								
Delaware	0	0	7	6	0	0	2	0
Maryland [2] [3]	4	4	84	77	0	0	17	7
District of Columbia	0	1	5	11	0	0	6	2
Virginia	1	1	180	101	0	0	14	14
West Virginia	3	1	145	70	0	0	19	27
North Carolina [4]	0	3	232	115	1	0	9	11
South Carolina [3]	0	1	11	18	1	0	19	8
Georgia [3]	2	0	20	15	1	0	6	19
Florida [3]	0	0	4	1	0	0	0	1
East South Central States:								
Kentucky	1	1	165	74	0	3	25	23
Tennessee	2	4	130	99	0	1	25	18
Alabama [3]	1	0	64	54	0	0	12	11
Mississippi	0	1	33	46	1	2	3	5

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Nov. 4, 1933, and Nov. 5, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932	Week ended Nov. 4, 1933	Week ended Nov. 5, 1932
West South Central States:								
Arkansas	1	1	8	19	0	0	5	13
Louisiana	0	0	28	26	0	0	13	8
Oklahoma [1]	0	1	29	34	0	0	45	18
Texas [1]	0	1	107	64	6	2	58	16
Mountain States:								
Montana	0	0	16	4	0	3	5	3
Idaho	0	0	3	3	0	8	0	2
Wyoming	0	0	12	17	0	0	0	0
Colorado	0	1	48	46	2	0	8	1
New Mexico	0	0	25	11	0	0	26	1
Arizona	0	0	4	6	0	0	2	3
Utah [2]	1	0	5	10	0	0	2	0
Pacific States:								
Washington	3	2	27	21	3	2	2	9
Oregon	0	1	53	25	1	0	0	5
California	4	5	182	119	8	5	20	8
Total	107	83	4,607	3,670	62	67	539	383

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Nov. 4, 1933, 70 cases, as follows: Maryland, 1; South Carolina, 1; Georgia, 13; Florida, 2; Alabama, 47; Texas, 6.
[4] Rocky Mountain spotted fever, week ended Nov. 4, 1933, North Carolina, 1 case.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
September 1933										
Nevada	1	1	1				0	2	0	3
South Carolina		304	560	2,019	117	200	4	27	0	134
October 1933										
Arkansas		138	42	759	65	21	0	85	1	40
Connecticut	1	4	10		18		13	161	0	7
Delaware		4			2		1	21	0	8
District of Columbia	1	51	3		6		2	40	0	17
Maine		10	18		7		16	29	0	20
Nebraska	1	17	8		8		4	88	1	6
New Mexico		46	1	13	52		0	90	2	99
Tennessee	5	402	184	1,012	211	5	12	533	4	123

September 1933

Nevada:	Cases.
Chicken pox	1
Septic sore throat	2
Tularaemia	1
Whooping cough	6
South Carolina:	
Chicken pox	27
Dengue	4
Diarrhea	824
Hookworm disease	107
Lethargic encephalitis	5
Mumps	18
Ophthalmia neonatorum	49
Paratyphoid fever	17

September 1933—Continued

South Carolina—Con.	Cases.
Rabies in animals	10
Tularaemia	4
Typhoid fever	12
Whooping cough	148

October 1933

Chicken pox:	
Arkansas	11
Connecticut	168
Delaware	9
District of Columbia	9
Maine	113

October 1933—Continued

Chicken pox—Con.	Cases.
Nebraska	48
New Mexico	13
Tennessee	21
Conjunctivitis:	
Delaware	1
Dysentery:	
Connecticut (amebic)	3
Connecticut (bacillary)	1
New Mexico	5
Tennessee	24
German measles:	
Connecticut	2
Delaware	1

October, 1933—Continued

	Cases
German measles—Con.	
Maine	8
Tennessee	2
Hookworm disease:	
Arkansas	1
Impetigo contagiosa:	
Tennessee	35
Lead poisoning:	
Connecticut	1
Lethargic encephalitis:	
Arkansas	1
Connecticut	3
District of Columbia	1
Nebraska	2
New Mexico	1
Tennessee	3
Mumps:	
Connecticut	118
Maine	10
Nebraska	5

October, 1933—Continued

	Cases
Mumps—Continued.	
New Mexico	16
Tennessee	22
Ophthalmia neonatorum:	
Tennessee	1
Puerperal septicemia:	
New Mexico	3
Tennessee	1
Rabies in animals:	
Connecticut	8
Maine	2
Scabies:	
Tennessee	2
Septic sore throat:	
Connecticut	6
Maine	2
New Mexico	4
Tennessee	63
Tetanus:	
Connecticut	2
Tennessee	2

October, 1933—Continued

	Cases
Trachoma:	
Arkansas	8
Tennessee	29
Undulant fever:	
Connecticut	4
Maine	5
New Mexico	1
Vincent's agina:	
Maine	2
Tennessee	11
Whooping cough:	
Arkansas	18
Connecticut	110
Delaware	25
District of Columbia	25
Maine	100
Nebraska	187
New Mexico	56
Tennessee	80

WEEKLY REPORTS FROM CITIES

City reports for week ended Oct. 28, 1933

State and city	Diphtheria cases	Influenza cases	Influenza deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Maine:											
Portland	0	------	0	0	0	0	0	1	0	4	17
New Hampshire:											
Concord	0	------	0	0	0	0	0	0	0	0	8
Nashua	0	------	0	0	0	12	0	0	0	0	0
Vermont:											
Barre	0	------	0	2	0	0	0	1	0	0	4
Burlington	0	------	0	0	0	0	0	0	0	0	5
Massachusetts:											
Boston	3	------	0	18	25	30	0	14	1	32	229
Fall River	0	------	1	0	0	3	0	0	1	4	17
Springfield	0	------	0	1	0	1	0	1	0	9	26
Worcester	1	------	0	53	7	6	0	2	0	20	52
Rhode Island:											
Pawtucket	0	------	0	0	0	3	0	0	0	0	17
Providence	1	1	0	0	2	4	0	3	0	8	56
Connecticut:											
Bridgeport	0	------	0	3	2	7	0	1	0	1	25
Hartford	0	1	0	0	0	3	0	0	1	0	37
New Haven	0	1	0	0	1	1	0	0	0	6	30
New York:											
Buffalo	3	------	0	4	22	16	0	5	0	11	114
New York	28	15	4	21	137	58	0	67	3	106	1,392
Rochester	0	------	0	0	1	2	0	1	2	7	47
Syracuse	0	------	0	0	4	2	0	0	0	12	34
New Jersey:											
Camden	4	------	0	0	3	6	0	1	0	0	38
Newark	0	8	0	2	4	9	0	4	0	33	89
Trenton	0	------	0	0	5	2	0	2	[1] 1	3	42
Pennsylvania:											
Philadelphia	2	9	7	23	32	38	0	24	6	38	466
Pittsburgh	0	1	2	2	20	26	0	3	0	19	150
Reading	2	------	0	1	2	1	0	0	0	4	25
Ohio:											
Cincinnati	14	1	2	6	9	27	0	7	0	6	128
Cleveland	12	43	5	0	7	51	0	10	0	37	186
Columbus	4	1	1	0	6	17	0	2	0	2	79
Toledo	2	1	0	0	2	17	0	3	0	2	89
Indiana:											
Fort Wayne	7	------	0	0	3	2	0	0	0	0	21
Indianapolis	3	------	0	1	15	24	0	2	0	2	------
South Bend	0	------	0	0	0	11	0	0	0	1	7
Terre Haute	0	------	0	5	1	0	0	0	0	0	19
Illinois:											
Chicago	1	5	2	7	41	91	0	38	1	51	724
Springfield	0	------	0	0	1	3	0	1	0	3	18

[1] Nonresident.

City reports for week ended Oct. 28, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Michigan:											
Detroit	12	4	2	2	12	42	0	17	3	68	213
Flint	3	----	0	0	2	23	0	1	0	0	24
Grand Rapids	0	----	2	0	0	3	0	0	0	5	38
Wisconsin:											
Kenosha	0	----	0	0	0	13	0	0	0	8	5
Madison	0	----	----	0	----	1	0	----	0	14	13
Milwaukee	8	1	1	2	4	14	0	1	0	58	81
Racine	0	----	0	1	0	5	0	0	1	5	10
Superior	0	----	0	0	0	0	0	0	0	1	6
Minnesota:											
Duluth	0	----	0	1	4	1	0	1	0	1	22
Minneapolis	5	----	1	2	4	10	0	0	0	20	89
St. Paul	0	----	0	2	5	13	0	3	2	5	55
Iowa:											
Des Moines	1	----	----	0	----	33	0	----	0	0	28
Sioux City	1	----	----	0	----	5	1	----	0	5	----
Waterloo	0	----	----	0	----	1	0	----	0	3	----
Missouri:											
Kansas City	3	----	1	1	14	16	0	9	0	1	101
St. Joseph	2	----	0	0	6	7	0	1	0	0	15
St. Louis	25	----	----	1	6	18	0	9	1	5	190
North Dakota:											
Fargo	0	----	0	0	0	2	0	1	0	2	6
Grand Forks	0	----	----	0	----	0	0	----	0	0	----
South Dakota:											
Aberdeen	0	----	----	1	----	0	0	----	1	0	----
Nebraska:											
Omaha	3	----	0	1	4	11	1	2	1	0	55
Kansas:											
Topeka	0	----	0	1	1	1	0	0	0	2	37
Wichita	0	----	0	0	1	7	0	0	0	2	29
Delaware:											
Wilmington	1	----	0	0	2	2	0	0	0	1	27
Maryland:											
Baltimore	3	4	2	2	8	22	0	9	0	35	185
Cumberland	0	----	0	0	1	4	0	0	0	0	10
Frederick	0	----	0	0	0	2	0	0	0	0	5
District of Columbia:											
Washington	12	1	0	2	9	9	0	7	2	6	146
Virginia:											
Lynchburg	2	----	0	0	0	6	0	0	1	0	12
Richmond	7	----	0	0	5	7	0	3	1	0	46
Roanoke	17	----	0	0	0	11	0	0	2	0	22
West Virginia:											
Charleston	8	----	0	0	0	3	0	1	1	0	6
Huntington	6	----	----	0	----	13	0	----	0	0	----
Wheeling	0	----	0	0	1	2	0	1	1	0	14
North Carolina:											
Raleigh	1	----	0	1	1	6	0	0	0	0	10
Wilmington	2	----	0	0	1	0	0	0	0	0	11
Winston-Salem	14	----	0	36	1	13	0	3	1	0	18
South Carolina:											
Charleston	0	11	0	0	3	1	0	2	0	0	22
Columbia	----	----	----	----	----	----	----	----	----	----	----
Greenville	1	----	0	0	2	0	0	1	0	3	16
Georgia:											
Atlanta	3	12	1	0	3	8	0	3	1	3	66
Brunswick	0	----	0	0	0	0	0	0	1	0	3
Savannah	2	25	0	0	1	0	0	2	0	1	24
Florida:											
Miami	0	----	0	0	0	0	0	2	0	0	18
Tampa	1	----	0	0	0	2	0	1	0	0	20
Kentucky:											
Ashland	4	----	----	0	----	10	0	----	5	0	----
Lexington	5	----	0	1	2	5	0	2	1	0	14
Louisville	24	3	0	0	4	16	0	2	1	0	54
Tennessee:											
Memphis	10	----	1	0	5	12	0	4	3	2	92
Nashville	7	----	0	0	5	10	0	2	1	1	47
Alabama:											
Birmingham	16	3	1	0	2	8	0	4	2	0	63
Mobile	2	----	0	1	0	0	0	0	0	0	15
Montgomery	3	----	----	0	----	2	0	----	1	3	----

City reports for week ended Oct. 28, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Arkansas:											
Fort Smith	0	----	----	0	----	1	0	----	0	2	----
Little Rock	1	----	0	0	0	1	0	0	0	0	----
Louisiana:											
New Orleans	14	4	4	1	7	7	0	11	13	0	145
Shreveport	6	----	0	0	0	6	0	2	0	0	47
Texas:											
Dallas	29	----	0	0	3	10	1	2	0	0	61
Fort Worth	11	----	0	0	3	2	0	0	0	0	33
Galveston	1	----	0	0	1	0	0	1	2	0	11
Houston	13	----	1	0	2	2	0	6	0	0	55
San Antonio	4	----	2	0	4	4	0	5	0	0	70
Montana:											
Billings	0	----	0	0	0	0	0	0	0	4	3
Great Falls	0	----	0	0	1	0	0	0	0	0	8
Helena	0	----	0	0	0	0	0	0	0	0	0
Missoula	0	----	0	0	1	0	0	0	0	0	5
Idaho:											
Boise	0	----	0	0	0	0	1	2	0	0	5
Colorado:											
Denver	3	27	0	1	9	12	2	7	3	20	91
Pueblo	0	----	0	0	0	1	0	1	2	2	11
New Mexico:											
Albuquerque	1	----	0	0	0	2	0	1	0	0	10
Utah:											
Salt Lake City	0	----	0	49	3	1	0	1	0	5	40
Nevada:											
Reno	0	----	0	0	2	0	0	0	0	0	5
Washington:											
Seattle	1	----	----	0	4	1	0	7	0	13	87
Spokane	0	1	1	22	----	1	0	----	0	2	20
Tacoma	0	----	0	0	1	4	0	1	0	2	26
Oregon:											
Portland	0	----	0	1	2	21	1	5	0	0	53
Salem	0	2	0	0	0	0	0	0	0	0	0
California:											
Los Angeles	25	9	1	3	7	35	8	19	1	64	229
Sacramento	0	----	0	3	1	5	0	4	0	1	28
San Francisco	5	1	0	3	0	10	0	9	0	20	120

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Maine:			
Portland	0	0	3
New Hampshire:			
Concord	0	0	1
Massachusetts:			
Boston	1	1	0
New York:			
New York	0	0	6
Syracuse	0	0	1
New Jersey:			
Newark	0	0	1
Trenton	0	1	0
Pennsylvania:			
Philadelphia	1	0	1
Ohio:			
Cincinnati	0	0	1
Cleveland	0	0	1
Illinois:			
Chicago	2	1	0
Michigan:			
Detroit	0	0	1
Madison	0	0	[1]1
Minnesota:			
Minneapolis	0	0	7
St. Paul	0	0	1
Missouri:			
St. Joseph	1	0	0
St. Louis	0	0	1
North Dakota:			
Fargo	0	0	1
Nebraska:			
Omaha	0	0	1
Kansas:			
Topeka	0	0	2
Maryland:			
Baltimore	1	0	2
Georgia:			
Atlanta	1	0	0
Tennessee:			
Nashville	0	0	1
Utah:			
Salt Lake City	1	0	0
Washington:			
Seattle	0	1	0
Tacoma	0	0	1
California:			
Los Angeles	1	0	0

[1] Nonresident.

Lethargic encephalitis.—Cases: New York, 1; Camden, N.J., 1; Madison, Wis., (nonresident) 1; Kansas City, Mo., 1; St. Louis, 6; Atlanta, 1; Louisville, 1; Houston, Tex., 1.

Pellagra.—Cases: Winston-Salem, N.C., 1; Memphis, 1; New Orleans, 2.

Typhus fever.—Cases: Savannah, 1; Montgomery, Ala., 4.

FOREIGN AND INSULAR

AUSTRALIA

Vital statistics—1932.—During the year 1932, births, deaths, and deaths from certain causes were reported in Australia as follows:

Population	6,575,253
Number of births	110,933
Birth rate per 1,000 population	16.9
Number of deaths	56,757
Death rate per 1,000 population	8.6
Deaths from—	
Cancer	6,875
Cerebral hemorrhage	3,021
Congenital debility and malformation	3,174
Deaths from—Continued	
Heart disease	11,074
Nephritis	3,440
Pneumonia and broncho-pneumonia	3,441
Senility	2,750
Tuberculosis	3,004
Violence (including suicide)	3,887

YUGOSLAVIA

Communicable diseases—September 1933.—During the month of September 1933, certain communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	121	11	Poliomyelitis	4	
Cerebrospinal meningitis	4	1	Scarlet fever	356	13
Diphtheria and croup	727	74	Sepsis	8	2
Dysentery	288	42	Tetanus	52	24
Erysipelas	171	3	Typhoid fever	540	42
Measles	434	4	Typhus fever	5	1
Paratyphoid fever	28				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Oct. 27, 1933, pp. 1328-1339. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Nov. 24, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

India—Madras.—During the week ended October 28, 1933, 4 cases of cholera with 1 death were reported in Madras, India.

Philippine Islands.—During the week ended November 4, 1933, cholera was reported in the Philippine Islands as follows: Antique Province, Dao, 2 cases, 1 death; Bohol Province, Clareng, 16 cases, 10 deaths; Jetafe, 18 cases, 10 deaths; Tubigon, 1 case, 1 death; Cebu Province, Cebu city, 1 case, 1 death; Malibuyog, 8 cases, 4 deaths; Naga, 9 cases, 6 deaths; Talisay, 4 cases, 3 deaths; Toledo, 1 case, 2 deaths; Iloilo Province, Iloilo, 1 case, 2 deaths.

Plague

India—Bombay Presidency—Poona city.—During the week ended October 7, 1933, 176 cases of plague, with 118 deaths were reported in Poona city, Bombay Presidency, India, 115 miles by railway from Bombay.

For the week ended September 30, 1933, 1,514 cases of plague with 904 deaths were reported in Bombay Presidency, India. In Bombay city one case and one death were reported during the same week.

Typhus Fever

Chile.—From January 1 to September 9, 1933, 5,471 cases of typhus fever occurred in the 17 Provinces of Chile, of which 1,095 or 35.9 per 100,000 inhabitants proved fatal. For the same period Antofagasta Province reported 5 cases, 1 death; Aconcagua Province, 48 cases, 3 deaths; Santiago Province, 2,344 cases, 480 deaths; Colchagua Province, 220 cases, 47 deaths; Nuble Province, 420 cases, 81 deaths; Concepcion Province, 1,109 cases, 200 deaths; Bio-Bio Province, 293 cases, 71 deaths; and Cautin Province, 773 cases, 176 deaths.

A report dated November 2, 1933, states that 45 cases of typhus fever had occurred in San Pedro Atacama, 185 miles east of Antofagasta, Chile.

×